



Ogden Air Logistics Center

Ogden Air Logistics Center



U.S. AIR FORCE

**Air Force Tactical
Shelters/Radomes/Towers
Product Group**

JOCOTAS 2-4 May 2005

Composite Technology Insertion
at HAFB

Terry Holland
OO-ALC/LHH
DSN 777-2860
terry.holland@hill.af.mil

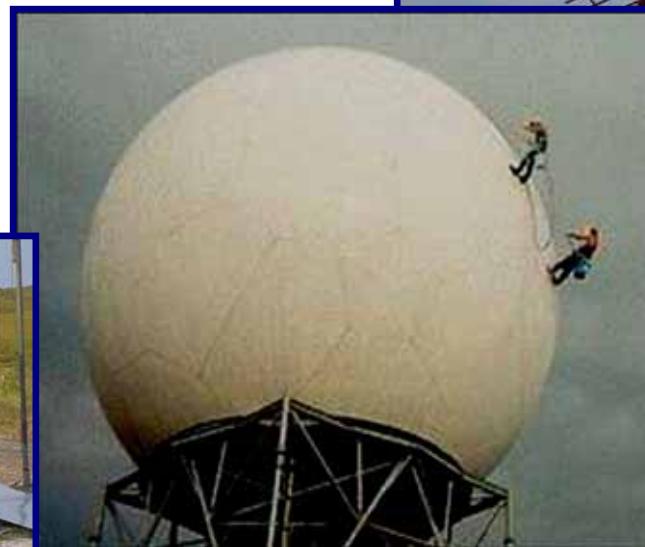
Report Documentation Page			Form Approved OMB No. 0704-0188	
<p>Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</p>				
1. REPORT DATE MAY 2005	2. REPORT TYPE	3. DATES COVERED 00-00-2005 to 00-00-2005		
4. TITLE AND SUBTITLE Composite Technology Insertion at HAFB		5a. CONTRACT NUMBER		
		5b. GRANT NUMBER		
		5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)		5d. PROJECT NUMBER		
		5e. TASK NUMBER		
		5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) OO-ALC/LHH,Hill AFB,UT,84056		8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)		
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited				
13. SUPPLEMENTARY NOTES 4th Bi-Annual DOD JOCOTAS Meeting with Rigid & Soft Wall Shelter Industry & Outdoor Exhibition, 2-4 May 2005, Port Hueneme, CA				
14. ABSTRACT				
15. SUBJECT TERMS				
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 26
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified		



Composite Initiative

Ogden Air Logistics Center

- **Objective**
 - Replace corroded structures with composite materials.
 - Shelters
 - Towers
 - Radomes
- **Advantages**
 - Composites are not subject to corrosion
 - Increased performance
 - Reduced maintenance costs
 - Increased life cycle





Other Teaming Partners/Sponsors

Ogden Air Logistics Center

- NEXRAD
- FAA
- NOAA
- NWS

- AFMC
- PACAF
- AFSPC
- AFSOC

- JOCOTAS
- ARMY
- NAVY
- Air Force

- LRM Inc. (TCD Inc.)
- WebCore Tech.
- Triton Systems
- RSI Inc.
- SES Inc.
- AHTNA Gov. Services
- CSS Inc.
- ICRC
- Lynntech Inc.
- Diamond Inc.

- Strongwell Inc.
- AK Supply Inc.
- Northern Power Inc.
- ISO Truss Inc.
- ITI Inc.
- AMPRO Inc.
- Touchstone Inc.
- AGS Inc.
- Schafer Inc.
- Goss Inc.

- AFC Inc.
- ATK Composites
- MCECC Inc.
- Total Solutions Inc.
- SUNREZ Inc.
- KaZak Inc.
- Nanosonic Inc.
- Integument Inc.
- Luna Inc.



Composite Shelter Program

Ogden Air Logistics Center

- **Objective**

- Develop new generation of composite shelters meeting a variety of mission requirements
 - Fixed Site shelters
 - ISO, LMS, S280
- Field new shelters at a competitive price
- Reduction of maintenance costs associated with corrosion



System Engineering Approach



Ogden Air Logistics Center

SFR- System Functional Review

PDR- Preliminary Design Review

CDR- Critical Design Review

SVR- System Verification Review

FQT- Formal Qualification Testing

FCA/PCA- Functional / Physical Configuration Audit



Innovation & Excellence



Tracking Instrumentation Subsystem (TIS) replacement for Stony Range at Eielson AFB



Ogden Air Logistics Center

- **Objective**

- Develop a composite shelter with enclosed power/communications systems to replace 8 existing TIS units



- **Status**

- Completed prototype and subsequent Units
- Installed communications systems with remote monitoring capabilities
- TRR held Mar 2005

- **Upcoming Tasks**

- Qualification Testing
- Installation of 8 shelters FY05



Existing Stony TIS site.



Exterior and interior views of composite shelter built to replace existing Stony units.



Additional Eielson Work

Ogden Air Logistics Center

- **Description**
 - 8 units for use at the Yukon range with the possibility of additional work beyond that
- **Status**
 - On contract
- **Upcoming Tasks**
 - To be completed and delivered to Eielson in the Fall of 2005



Existing Yukon TIS site.



Exterior view of composite shelter designed for Yukon site replacement.



TACAN Shelter for Beale

Ogden Air Logistics Center

- **Objective**

- Replace severely damaged TACAN building with composite shelter at Beale AFB

- **Status**

- In communication with Civil Engineering people at Beale to build structure per their specifications

- **Upcoming Tasks**

- Anticipate additional customers who would benefit from this type of shelter for use with TACAN systems

Composite shelter design
for replacement of USAFE
and ATCALS units.



TACAN building to be replaced





USAFE Shelter



Ogden Air Logistics Center

- **Objective**
 - Replace corroded weather radar shelter with composite shelter for USAFE
- **Status**
 - Vendor on Contract
- **Upcoming Tasks**
 - Anticipate additional customers who would benefit from this type of shelter



USAFE metallic shelter to be replaced



Composite shelter design
for replacement of
USAFE shelter.



NAVY BMF ISO Shelter

Ogden Air Logistics Center

- **Objective**

- DEM/QUAL an 8'x8'x20' Composite BMF ISO Shelter
- Conduct EMD for long-term procurement

- **Status**

- 2 Prototypes
- Conducted ISO development testing
- 6-high stacking demonstrated
- 3rd prototype under way

- **Upcoming Tasks**

- ISO Testing 9-high stacking loads.



Joint of Thermoplastic ISO Shelter Prototype, Thermoplastic Prototype Shelter



ARMY LMS Composite Shelter

Ogden Air Logistics Center

- **Objective**

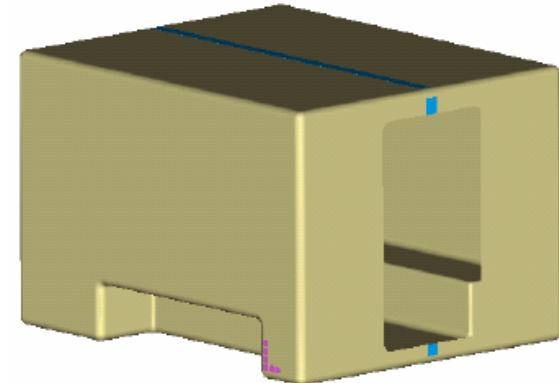
- Develop a light-weight, EMI-protected, HMMWV-mounted, rigid wall LMS composite shelter
- Develop composite EMI technology in partnership with Defense Threat Reduction Agency (Funding through SBIR Program)

- **Status**

- Produced first prototype composite LMS
- Preparing for EMI Testing
- Materials: Graphite skin, foam core, copper mesh

- **Upcoming Tasks**

- Complete EMI Testing



Existing LMS Shelter (Aluminum Skin with Honeycomb Core), Computer Model: LMS Composite Shelter



Composite Shelters Summary

Ogden Air Logistics Center

- **20 Fixed Site Shelters currently on contract**
- **Composite ISO, LMS continuing development testing**
 - Commercialization FY07



VAFB Weather Instrument Towers

Ogden Air Logistics Center

- **Objective**
 - Replace unsafe, badly corroded weather towers with tilt-down composite towers
 - Used SBIR funded composite technology for tower development



Corroded staircase weather tower (VAFB)



Newly erected composite ISOTRUSS Tower (VAFB)



VAFB Weather Instrument Towers

Ogden Air Logistics Center



Climbing was required for servicing



Tilt-down tower facilitates easy service

- Safer for service operations
- Technicians do not need to climb tower



Towers 57 and 58, Erected Dec 2004

Ogden Air Logistics Center



Vandenberg AFB, CA



Innovation & Excellence



Successful Tower Solutions



Ogden Air Logistics Center



- **Tower 60 at VAFB**
 - 60-ft Composite Weather Tower
 - Erected Oct 2003

- **Tower 215 at CCAS**
 - 60-ft Composite Weather Tower
 - Erected May 2003
 - No damage to tower during hurricanes Frances and Ivan



Glideslope Towers

Ogden Air Logistics Center

Composite Glideslope Towers to be installed at:



Corroded Glideslope tower (GUAM)

- Andersen AB, Guam (Est. June 2005)
- Yokota AB, Japan (Est. Sept 2005)
- Misawa AB, Japan (Est. FY06)



Proposed Composite Glideslope Tower



Glideslope Tower Solution

Ogden Air Logistics Center



- Commercially available product (German based company)
- Only tower to meet frangibility requirement (ICAO 2005)
- Improved performance: Deflection <1" at 60 ft and 56 mph wind, Current tower = 3"
- Withstand high wind speeds: up to 400 kph (248 mph)
- Corrosion resistant: Composite design; UV secure paint
- 'Tilt-up' tower design – minimal installation time



Monopole Tower Solutions

Ogden Air Logistics Center



- 14 Monopole Towers to be built for the 45th Space Wing at Cape Canaveral in June 2005



Innovation & Excellence



Composite Towers Summary



Ogden Air Logistics Center

- **4 weather towers fielded – 1 at CCAS, 3 at VAFB**
- **1 weather tower on contract**
 - Expect FY05 install at CCAS
- **14 monopoles**
 - Expect FY05 install at CCAS
- **5 glide slope towers on contract**
 - Expect 1st install FY05 at AAFB



Composite Radome Program

Ogden Air Logistics Center

- **Objective**
 - Develop and field new generation of composite radomes
 - Less expensive
 - Improved properties
 - Impact resistance
 - Transmission
 - Reduced maintenance



Radome Industry Day



Ogden Air Logistics Center

- Held 18-19 October 2004 at Hill AFB
- 11 Radome and plastics manufacturing companies attended
 - MFG/Ratech
 - Prime Manufacturing Technologies, Inc.
 - L3 Communications/ESSCO
 - Saint-Gobain
 - Starwin Industries
 - ATK (i.e. ATK-MRC and ATK-Composites)
 - Battelle
 - Thermoplastic Composite Designs (TCD)
 - Antennas for Communications (AFC)
 - Composite Matrix Corporation
 - General Dynamics



MILSTAR Radomes

Ogden Air Logistics Center

- **Project Status**

- Project on schedule for deployment 20 May 2005
- Dual thermoplastic/thermoset path being pursued
- RF testing for both designs/materials completed - Both exceed RF requirement
- Mechanical/physical coupon testing ongoing
- Initial FEA for each design complete
- Initial impact analysis complete advanced impact analysis ongoing
- Prototypes for both designs complete



**MILSTAR Radome and Shelter
Depiction—Fixed Site & Transportable**



Program Outlook

Ogden Air Logistics Center

- **MILSTAR Radome success will lead into additional radome projects with AFSPC**
- **PACAF Replacement List**
 - Currently exploring options for AN/FPS-117 Radomes
 - Communicating with Program Office for VOR, VORTAC, and TACAN systems



Cape Newenham, AK



Cape Romanzof, AK



Program Outlook

Ogden Air Logistics Center



Working with the Navy for “Low Risk” Composite Shipboard Equipment
Shelters/Radomes/Towers

Innovation & Excellence



SBIRS SUPPORTING TECHNOLOGY DEVELOPMENT



Ogden Air Logistics Center

SBIR Projects	SBIR Projects
Develop composite ISO shelter	Develop low cost, high tensile strength composite materials
Develop composite LMS shelter	Develop advanced composite structural solution for tall, narrow structures
Develop UV resistant composite materials	Vinyl Ester Resin (VERs) without Volatile Organic Compounds (VOCs)
Develop chemical, biological, radiological agent resistant composite materials	Thermoplastic Large, Ground-Based Radomes
Develop thermo-plastic materials replacement for composite or metal shelters	Fire resistance
EMI for Fixed Site Shelters	Composite roller bearing
Automated pigmentation for composites	
Alternative Energy Source for APU	